

17. A group of 5 patients treated with medicine 'A' weight 42, 39, 48, 60 and 41 kgs. Second group of 7 patients from same hospital treated with medicine 'B' weight 38, 42, 56, 64, 68, 69 and 62 kgs. Do you agree with the claim that medicine 'B' increases the weight significantly?

18. Two random samples were drawn from two normal populations and their values are

A 66 67 75 76 82 84 88 90 92

B 64 66 74 78 82 85 87 92 93 95 97

Test whether the two populations have the same variance at 5% level of significance.

19. Calculate Karl Pearson's coefficient of correlation for the following data.

X: 57 58 59 59 60 61 62 64 65 68

Y: 67 68 68 65 72 69 72 71 80 89

20. You are given following data.

	X	Y
Arithmetic mean	36	85
Standard deviation	11	8

Correlation coefficient between X and Y is 0.66
obtain the two regression equations.

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23UEDA22A — MATHEMATICAL
STATISTICS - II

Time : Three hours

Maximum : 75 marks

SECTION A — ($10 \times 2 = 20$ marks)

Answer ALL questions.

1. Define statistical hypothesis.
2. Define sample and population.
3. Define student t - distribution.
4. State the assumption of students ' t ' test.
5. Write the formula for F - distribution.
6. What are the applications of F - test?
7. Define correlation.
8. What is scatter diagram?
9. Define linear regression.
10. What the types of regression?



SECTION B — ($5 \times 5 = 25$ marks)

Answer ALL questions.

11. (a) Explain the step by step procedure for testing of hypothesis.

Or

- (b) Explain the procedure for testing the difference between two proportions under large sample test.

12. (a) Certain pesticide is packed into bags by a machine. A random sample of 10 bags is drawn and their contents are found to weight (in Kg) as follows : 50, 49, 52, 44, 45, 48, 46, 45, 49, 45 test if the average packing can be taken to be 50 kg.

Or

- (b) Explain the properties of t - distribution.

13. (a) Derive the student F - distribution.

Or

- (b) Obtain the mode of F - distribution.

14. (a) Compute Spearman rank correlation coefficient to the following data.

Marks in mathematics 68 64 75 50 64 80 75 40 55 64
Marks in statistics 62 58 68 45 81 60 68 48 50 70

Or

- (b) Calculate Karl Pearson's co-efficient of correlation from the following data.

X 10 12 18 24 23 27
Y 13 18 12 25 30 10

- (a) Compute the two regression equations from the following data.

X 1 2 3 4 5
Y 3 4 5 6 7

If $x = 3.5$ what will be the value of Y ?

Or

- (b) Distinguish between linear and non-linear regression.

SECTION C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. A test of the breaking strengths of two different types of cables was conducted using samples of $n_1 = n_2 = 100$ pieces of each type of cable.

Cable I Cable II
 $\bar{X}_1 = 1925$ $\bar{X}_2 = 1925$
 $\sigma_1 = 40$ $\sigma_2 = 30$

Do the data provide sufficient evidence to indicate a difference between the mean breaking strengths of the two cables?

